

### *Amendments to the Claims*

The listing of claims below will replace all prior versions and listings of claims in the application.

1. (Currently Amended) A background memory manager (BMM) for managing a memory in a data processing system, the BMM comprising:

    circuitry ~~for transferring to transfer a data structures structure~~ to and from an outside device and to and from a memory; and

~~a memory state map associated with the memory; and~~

    a communication ~~link to a processor; link;~~

~~characterized in that the BMM manages the memory, determining management logic coupled to a processor by the communication link and configured to determine if each the data structure fits into the memory, deciding exactly where to place each data structure in to decide where, in a plurality of regions in the memory, performing all to store the data structure, to perform data transfers between the outside device and the memory, and maintaining the to maintain a memory state map according to memory transactions made, and informing to inform the processor of new data and its location.~~

2. (Currently Amended) The BMM of claim 1, wherein the ~~BMM, in storing a given data structure, provides~~ management logic is further configured to provide, for the data structure and when the data structure is stored, a data identifier for the given data structure, on the link to the processor. communication link.

3. (Currently Amended) The BMM of claim 2 2, wherein the ~~BMM~~, in making management logic is further configured to update, in response to the memory transactions, updates the memory state map to a new memory state, keeping state to keep track of regions occupied by valid data and regions ~~not occupied~~ unoccupied by valid data.

4. (Currently Amended) The BMM of claim 2 2, wherein the ~~BMM~~, management logic is further configured to copy, in response to a signal on the processor communication link that the processor is finished with ~~certain-identified data in the memory, copies the identified data~~ from the ~~memory, if needed,~~ memory to another ~~device,~~ device and ~~updates to update the~~ memory state map to indicate a new memory state for a region of the identified data copied. data.

5. (Currently Amended) The BMM of claim 4 1, further comprising an interrupt handler allowing configured to allow a remote data source to interrupt the BMM when data is available to be transferred to the memory.

6. (Currently Amended) The BMM of claim 4 1, wherein data handled by the BMM constitutes network data packets.

7. (Currently Amended) A data processing system, comprising:

a processor;

a memory coupled to the processor; and

a background memory manager (BMM) coupled to the memory and the processor, the ~~background memory manager BMM~~ including circuitry ~~for transferring to transfer~~ a data structure to and from an outside device and to and from the memory, and a memory state map associated with the memory;

~~characterized in that the BMM manages the memory, determining memory and including management logic configured to determine if each the data structure fits into the memory, deciding exactly where to place the data structure in to decide where, in a plurality of regions in the memory, performing all to store the data structure, to perform data transfers between the outside device and the memory, and maintaining the to maintain a memory state map according to memory transactions made, and informing to inform the processor of new data and its location.~~

8. (Currently Amended) The data processing system of claim 7 7, wherein the ~~BMM~~, in storing a given data structure in the memory, provides management logic is further configured to provide, for the data structure and when the data structure is stored, a data identifier for the given data structure to the processor.

9. (Currently Amended) The data processing system of claim 8 8, wherein the ~~BMM~~, in making management logic is further configured to update, in response to the memory transactions, updates the memory state map to a new memory state, keeping state to keep track of regions occupied by valid data and regions not occupied unoccupied by valid data.

10. (Currently Amended) The data processing system of claim 8 8, wherein the ~~BMM~~, management logic is further configured to copy, in response to a signal from the processor that the processor is finished with ~~certain~~-identified data in the memory, ~~copies~~-the identified ~~data, if necessary,~~ data from the memory to another ~~device,~~ device and ~~updates~~ to update the memory state map to indicate a new memory state for a region of the identified data ~~copied~~-data.

11. (Currently Amended) The data processing system of claim 7 7, further comprising an interrupt handler ~~allowing~~ configured to allow a remote data source to interrupt the BMM when data is available to be transferred to the memory.

12. (Currently Amended) The data processing system of claim 7 7, wherein data handled by the BMM constitutes network data packets.

13. (Currently Amended) A network packet router, comprising:

an input/output (I/O) device ~~for receiving and sending packets~~ configured to receive and to send a packet on the network;

a processor;

a memory coupled to the processor; and

a background memory manager (BMM) coupled to the memory and the processor, the ~~background memory manager~~ BMM including circuitry ~~for transferring packets~~ configured to transfer the packet to and from the I/O device and to and from the ~~memory, and a memory state map associated with the memory;~~

~~\_\_\_\_\_ characterized in that the BMM manages the memory, determining memory~~  
~~and including management logic configured to determine if each data the packet fits into the~~  
~~memory, deciding exactly where to place each data packet in to decide where, in a plurality~~  
~~of regions in the memory, performing all to store the packet, to perform data transfers~~  
~~between the outside I/O device and the memory, and maintaining the to maintain a memory~~  
~~state map according to memory transactions made, and informing to inform the processor of~~  
~~new data and its location.~~

14. (Currently Amended) The data router of claim ~~13~~ 13, wherein the ~~BMM, in the process~~  
~~of storing a given packet into the memory, provides~~ management logic is further configured  
to provide, for the packet and when the packet is stored, a data identifier for the given packet  
to the processor.

15. (Currently Amended) The data router of claim ~~14~~ 14, wherein the ~~BMM, in making~~  
management logic is further configured to update, in response to the memory transactions,  
~~updates the memory state map to a new memory state, keeping state to keep track of regions~~  
~~occupied by valid packets and regions not occupied~~ unoccupied by valid packets.

16. (Currently Amended) The data router of claim ~~14~~ 14, wherein the ~~BMM, management~~  
logic is further configured to copy, in response to a signal that the processor is finished with a  
first packet in the memory, copies the first packet, if necessary, packet from the memory to  
the I/O ~~device, device~~ and updates to update the memory state map to indicate a new memory  
state for a region of the first packet copied. packet.

17. (Currently Amended) The data router of claim ~~13~~ 13, further comprising an interrupt handler ~~allowing~~ configured to allow the I/O device to interrupt the BMM when packets are available to be transferred to the memory.

18. (Currently Amended) A method for managing a memory in a data processing system having a processor, the method comprising:

(a) transferring ~~a data structures~~ structure to and from an outside device and to and from the memory by circuitry in a background memory manager (BMM);

(b) determining by the BMM if ~~each~~ the data structure from the outside device will fit into available space in the memory;

(c) deciding by the BMM exactly ~~where~~ where, in a plurality of regions in the ~~memory~~ memory, to store ~~each~~ the data structure; and

(d) updating a memory state map ~~associated with the memory in the BMM each time~~ when a memory transaction is made.

19. (Currently Amended) The method of claim ~~18~~ 18 ~~wherein, in step (c), the BMM, in storing a given data structure into the memory, provides~~ 18, further comprising providing, for the data structure and when the data structure is stored, a data identifier for the given data structure on a link to the processor.

20. (Currently Amended) The method of claim ~~19~~ 19 ~~wherein the BMM, in step (b), in making memory transactions, updates the memory state map to a new memory state,~~ 19, further

comprising keeping track of regions occupied by valid data and regions ~~not occupied~~  
unoccupied by valid data.

21. (Currently Amended) The method of claim ~~19 wherein, in step (a), the BMM,~~ 19, further  
comprising:

copying, in response to a signal that the processor is finished with ~~certain~~ identified  
data in the memory, ~~copies the identified data, if necessary,~~ data from the memory to another  
device, device; and

~~updates~~ updating the memory state map to indicate a new memory state for a region  
of the ~~data copied.~~ identified data.

22. (Currently Amended) The method of claim ~~18~~ 18, further comprising ~~a step for~~  
interrupting the BMM by the outside device when data is available to be transferred to the  
memory.

23. (Currently Amended) The method of claim ~~18~~ 18, wherein data handled by the BMM  
constitutes network data packets.

24. (Currently Amended) The method of claim ~~23~~ 23, wherein the network is data packets  
are conveyed on the Internet.

25. (New) The data router of claim 13, wherein the BMM is further characterized by being configured to notify the processor when enough of the packet is stored for the processor to begin to perform desired processing.